

**CABINET-REAR VIEW**  
**DISASSEMBLY INSTRUCTIONS**

**CHASSIS REMOVAL**

Remove five screws holding cabinet back and remove cabinet back. Remove knobs from cabinet.

Disconnect picture-tube socket, high-voltage anode lead, speaker leads, and ground strap. Loosen screw holding yoke.

Remove three screws holding tuner assembly. Slide chassis and tuner assembly from the cabinet front.

**PICTURE TUBE REMOVAL**

Follow Chassis Removal procedure and lay set face down on a soft protective surface.

Remove four screws holding picture tube retaining wire. Lift out the picture tube. Do not lift picture tube by the neck.

**SERVICING IN THE FIELD**

**CRT IMPLOSION PROTECTION AND CLEANING**

Implosion protection is an integral part of the picture tube, cleaning accomplished without CRT removal.

**FUSE DEVICES**

A 4-amp fuse is used for AC line protection. (See photo, Cabinet-Rear View.)

**VHF TUNER**

Set fine tuning at the center of its range and adjust oscillator slug (one for each channel) for best sound and picture.

**HORIZONTAL OSCILLATOR**

Adjustment of the horizontal hold is accomplished by the proper setting of the horizontal hold coil. (See photo, Cabinet-Rear View.)

**WIDTH**

The width may be varied by connecting the lead from R270 to various voltage points. (See photo, Cabinet-Rear View.)

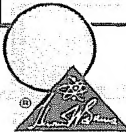
**CENTERING**

Centering is accomplished by proper adjustment of two magnetic rings located on the yoke rear cover.

SET 1354 FOLDER 2

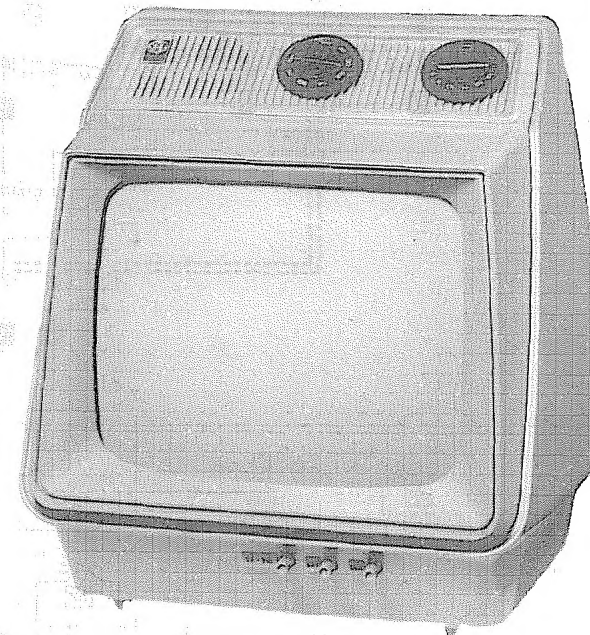
GENERAL ELECTRIC CHASSIS  
9SF, 12SF, 15SF

**PHOTOFACT® Folder** with **CIRCUITRACE**



For Supplier Address See PHOTOFACT Index

**GENERAL ELECTRIC CHASSIS**  
**9SF, 12SF, 15SF**



MODEL SF1600BG

**SAFETY PRECAUTIONS**

Make sure line voltage does not exceed rating of set. Check high-voltage regulation and adjust to correct value.

Be sure shields and rear cover are in place and secure.

Beware of shock from high voltage or AC line. Discharge high voltage to HV cage only.

Use extreme care when handling picture tube. Do not bump, scratch, or exert undue strain.

**CAUTION:** One side of AC line connected to chassis. Use isolation transformer for servicing. Make certain isolation networks are in place and exposed metal is safe to touch before returning set to customer.

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**HOWARD W. SAMS & CO., INC.** Indianapolis, Indiana 46206



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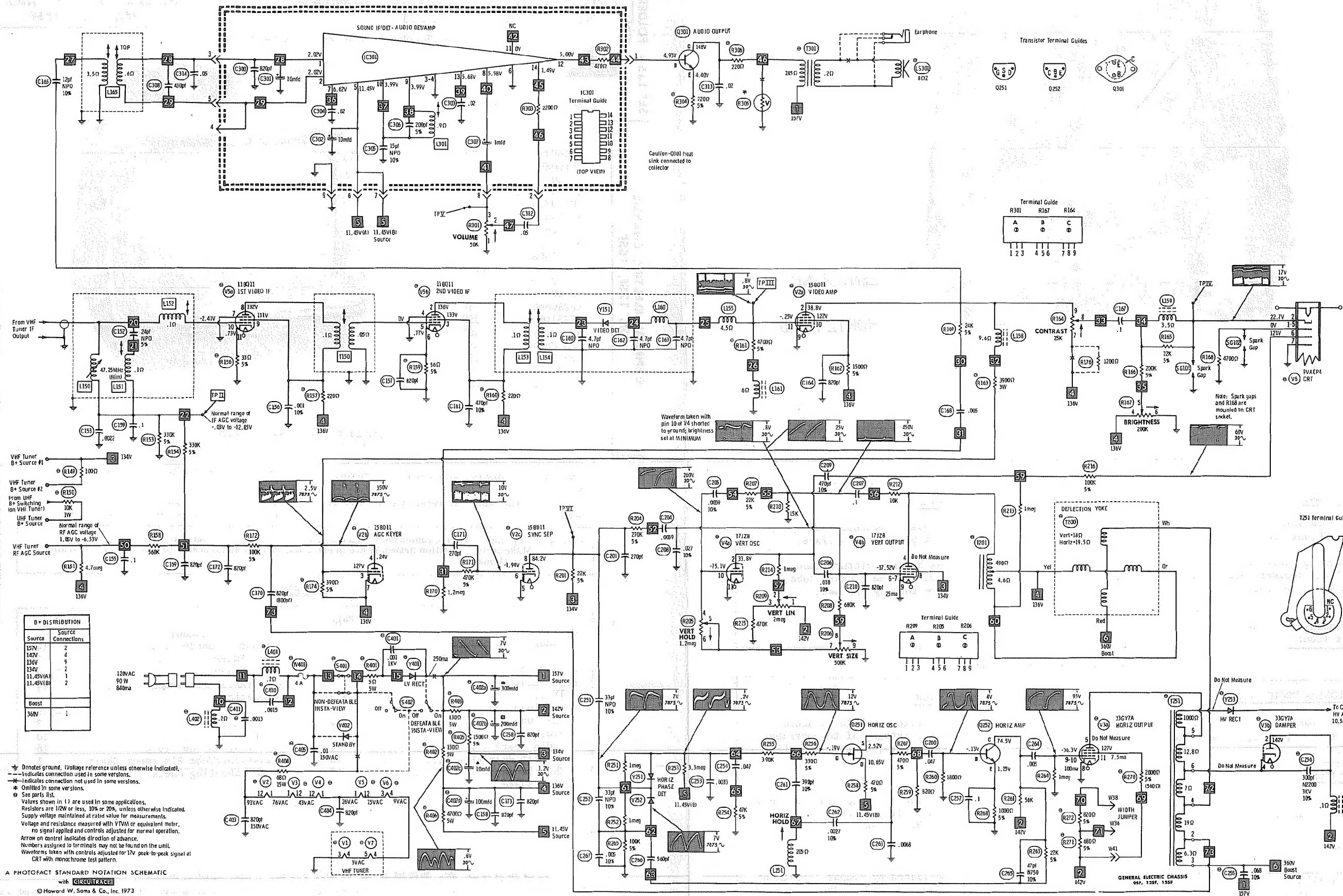
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DATE 11-73

SET 1354 FOLDER 2

GENERAL ELECTRIC CHASSIS  
9SF, 12SF, 15SF

SET 1354 FOLDER 2



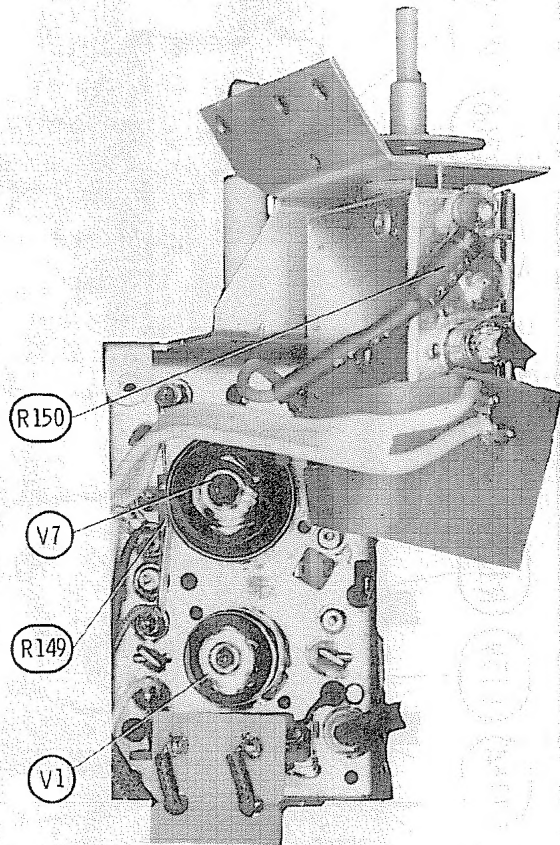


RESISTANCE MEASUREMENTS

ITEM	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9	PIN 10	PIN 11	PIN 12	PIN 13	PIN 14
V1 - VHF	0Ω	1meg	0Ω	1Ω	1300Ω †	0Ω	0Ω							
V2	24Ω	3500Ω †	530Ω †	700K	0Ω	1.7meg	130Ω †	22K †	0Ω	1630Ω †	300Ω *	28Ω		
V3	24Ω	130Ω †	NC	INF	12Ω †	NC	NC	0Ω	1meg	1meg	2100Ω †	14Ω		
V4	8Ω	1.6meg †	NC	650Ω †	NC	900K	1630Ω †	0Ω	0Ω	1meg	0Ω	14Ω		
V5	8Ω	350Ω †	350Ω †	0Ω	.05Ω	56Ω	0Ω	350Ω †	350Ω †	300K	33Ω	5Ω		
V6	4700Ω	220K †	5Ω	3Ω	4700Ω	1.2meg †	0Ω							
V7 - VHF	15K	5000Ω †	0Ω	3Ω	1Ω	1000Ω †	1630Ω †	0Ω	220K					
MEASUREMENTS BELOW TAKEN WITH METER HAVING .08V MAX BETWEEN PROBE TIPS														
IC301	INF	INF	0Ω	0Ω	2000Ω	0Ω	9500Ω	8000Ω	4500Ω	4500Ω	INF	8000Ω	7000Ω	90K
ITEM	E	B	C		ITEM	E	B	C		ITEM	E	B	C	
Q100-UHF	680Ω	2000Ω	8200Ω		Q251	2000Ω	2meg	1300Ω		Q301	220Ω	8000Ω	20K	
					Q252	1000Ω	1800Ω	250K						

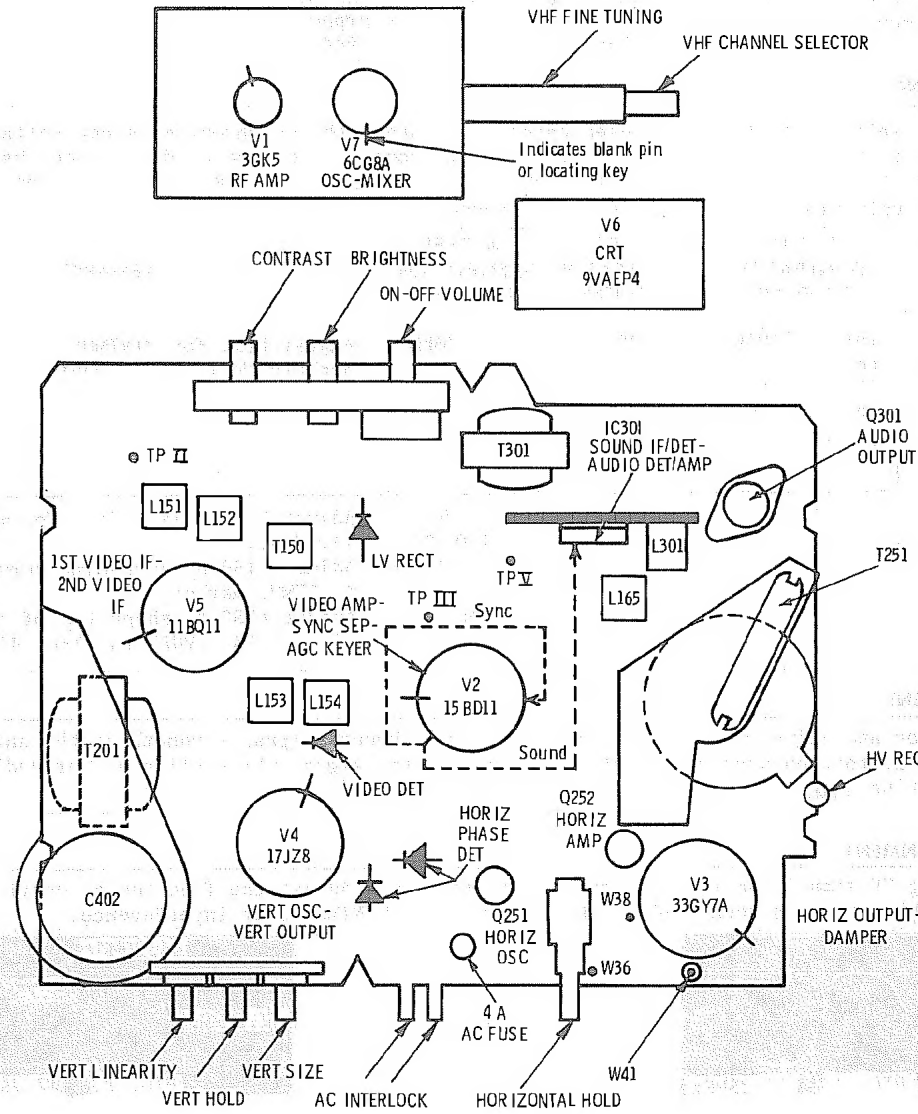
† MEASURED FROM CATHODE OF Y401.  
‡ MEASURED FROM PIN 4 OF V3.

\* READING DEPENDS UPON POLARITY OF METER CONNECTIONS.  
NC NO CONNECTION

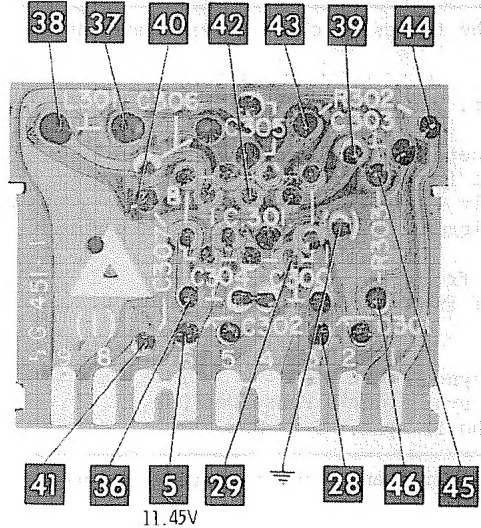
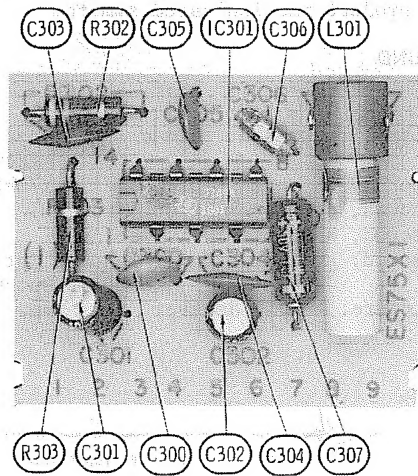


TUNER ASSEMBLY

TRANSISTOR/TUBE PLACEMENT CHART



GENERAL ELECTRIC CHASSIS  
9SF, 12SF, 15SF



AUDIO BOARD

A Howard W. Sams CIRCUITRAGE Photo

FOLDER 2

## TV ALIGNMENT INSTRUCTIONS

Use an isolation transformer, or observe polarity, and maintain voltage at 120VAC.  
Allow a 20-minute warm-up period for the receiver and test equipment.  
Suggested Alignment Tools: GC ELECTRONICS  
L151 thru L154, L301, T150 ..... 9440

### VIDEO IF ALIGNMENT

Set the channel selector to highest unused channel. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. Use only enough generator output to provide a usable indication. Note: Response may vary slightly from that shown. Connect a -3.5 volt bias to TPII, low side to ground.

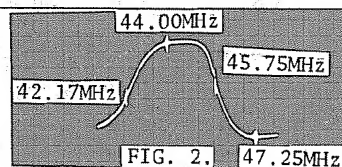
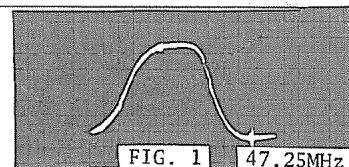
CONNECT SCOPE	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	REMARKS
Vertical input to TPIII, low side to ground.	Thru .001mfd to U on VHF tuner, low side to ground.	44MHz (10MHz Sweep)	47.25MHz	Adjust L151 for MINIMUM. See Figure 1 for response.
"	"	"	42.17MHz 44.00MHz 45.75MHz 47.25MHz (See Fig.2)	Adjust L153, L154, T150 for maximum at 44.00MHz. Adjust L150 by spreading turns to place 42.17MHz marker. Adjust L152 to shape top of response. Adjust L135 (VHF) to place 45.75MHz marker.

### SOUND IF ALIGNMENT

Tune in a station and adjust L165 Top for maximum sound. Reduce signal strength at the antenna terminals until distortion appears. Continue to reduce the signal while aligning for undistorted output by adjusting L301.

### 4.5MHz TRAP ALIGNMENT

Tune in a strong TV signal and set the contrast at maximum. Adjust the fine tuning until a beat pattern is visible on the screen. Adjust L165 Bottom for MINIMUM beat interference.



## TROUBLESHOOTING CHECK CHART

The following chart lists component failures most likely to produce the indicated symptom.

### SWEEP

No raster, has sound: Horiz Osc/Amp/Output, Damper, HV Rect, CRT  
No vert deflection: Vert Osc/Output  
Poor vert lin or foldover: Vert Osc/Output  
Poor horiz lin or foldover: Horiz Output, Damper  
Narrow picture: LV Rect, Horiz Osc/Amp/Output, Damper  
Vert off freq: Vert Osc  
Horiz off freq: Horiz Phase Det/Osc

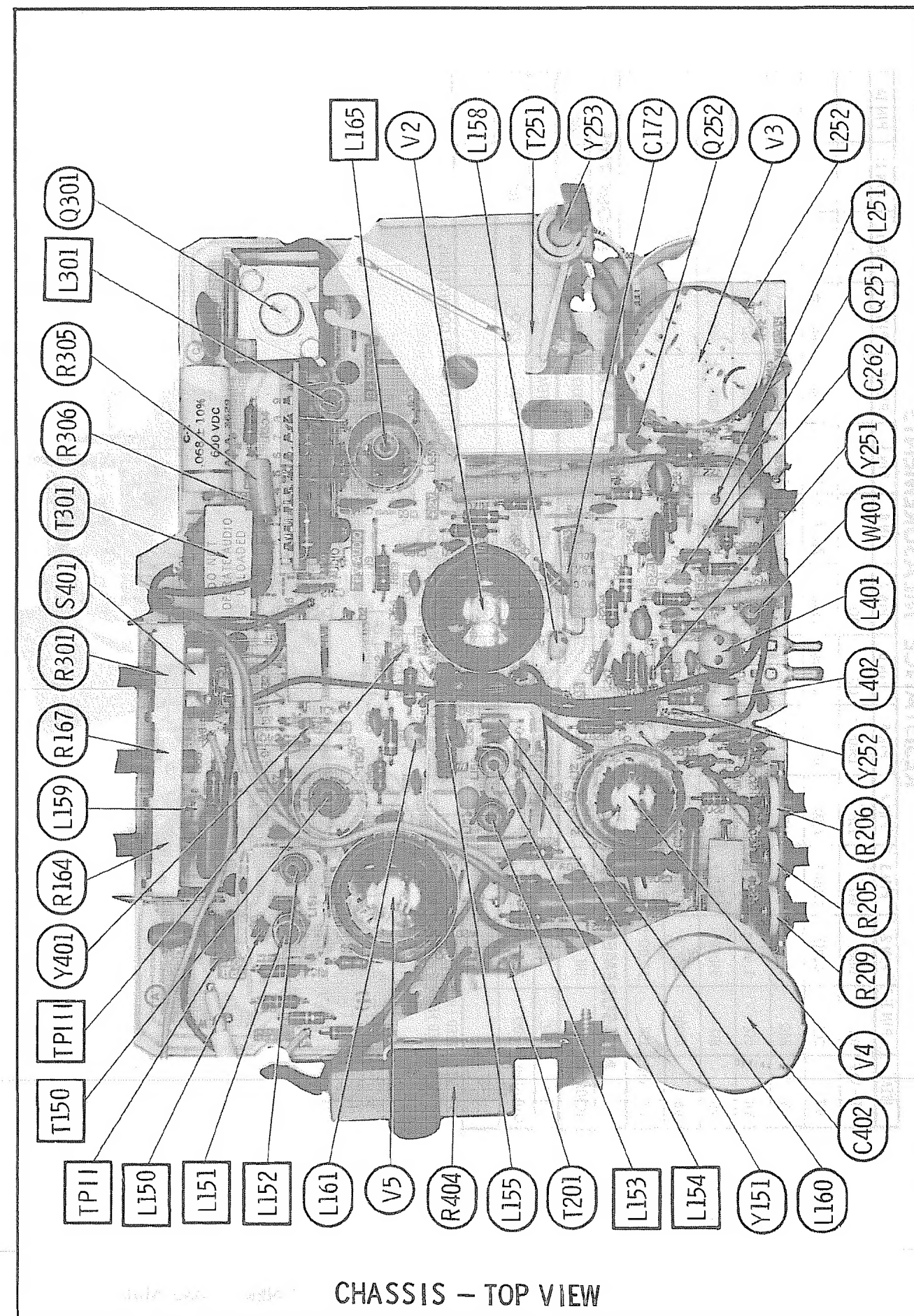
### SYNC

No vert sync: Vert Osc  
No horiz sync: Horiz Phase Det/Osc  
No vert/horiz sync: Sync Sep

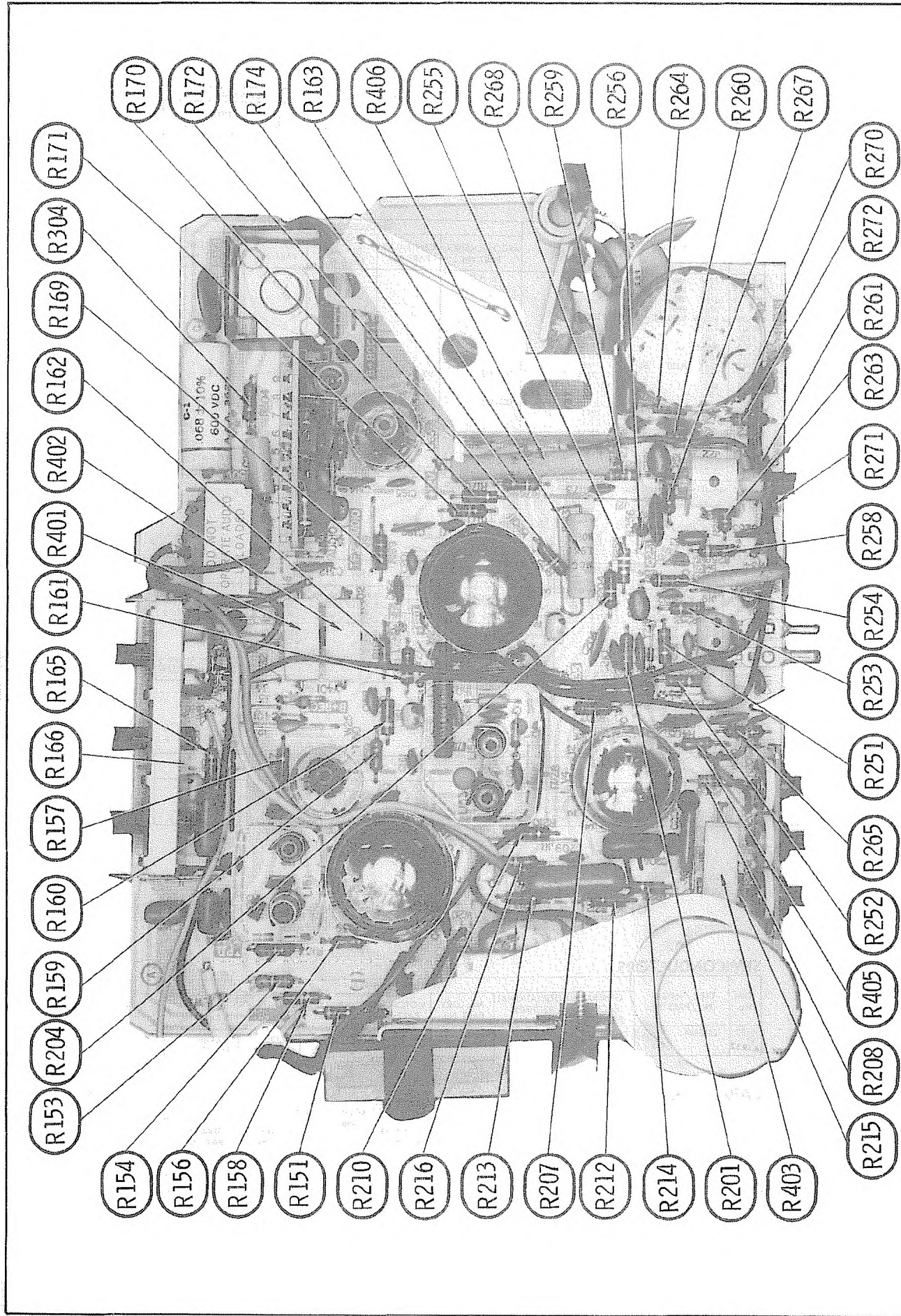
### PICTURE or SOUND

No pic, no sound, no raster: Fuse, LV Rect  
No pic, no sound, has raster: Video IFs, Tuner Mixer  
No pic, no sound, has snow: Tuner RF/Mixer/Osc.  
No pic, has sound, no raster: Video Amp, CRT  
No pic, has sound, has raster: Video Amp  
Has pic, no sound: Sound IF Det/IF, Audio Det, Audio Amp/Output  
Overloaded picture: AGC, Video Det.

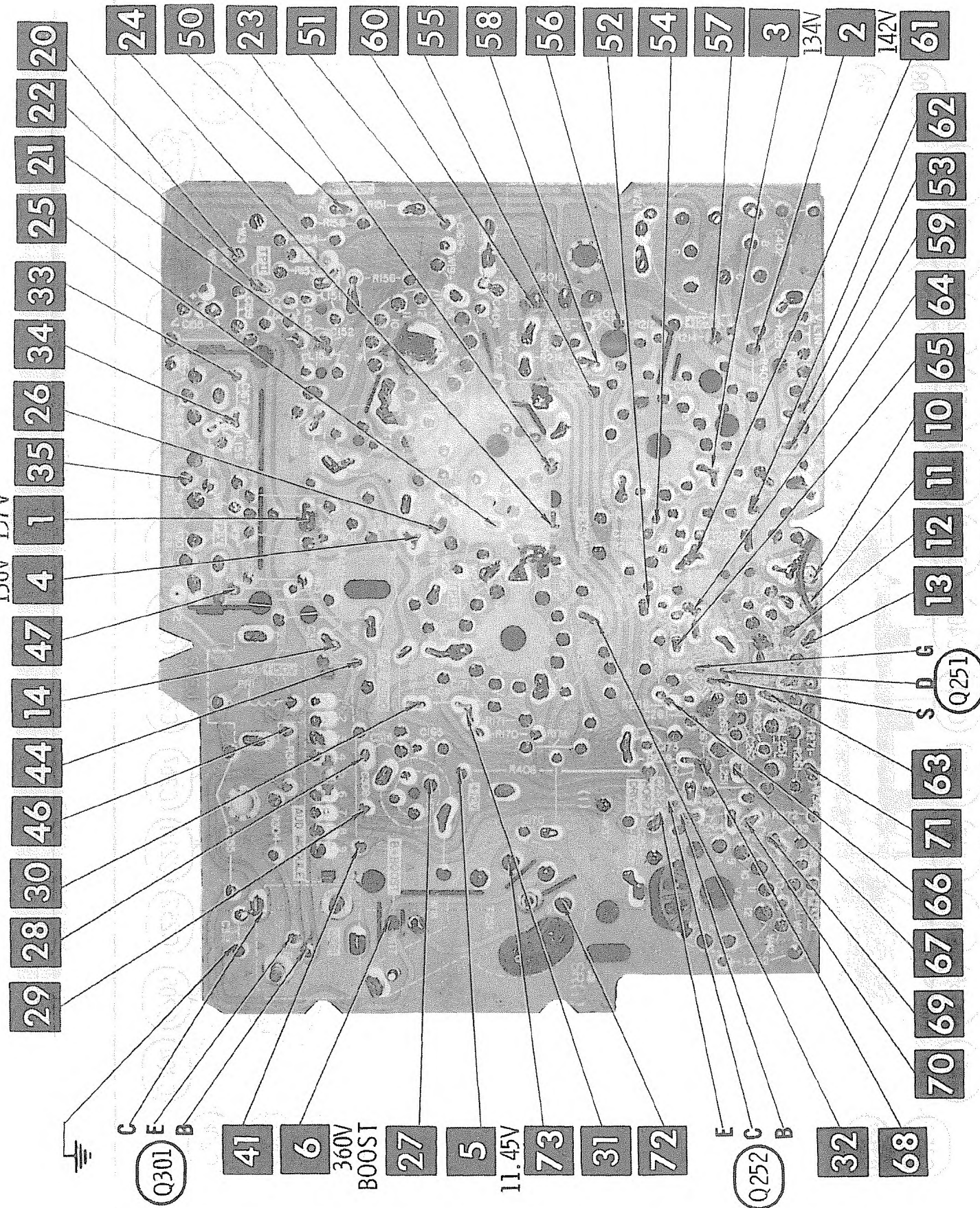
A series filament circuit is used; an open filament in any tube will cause the set to be inoperative.







136V 157V



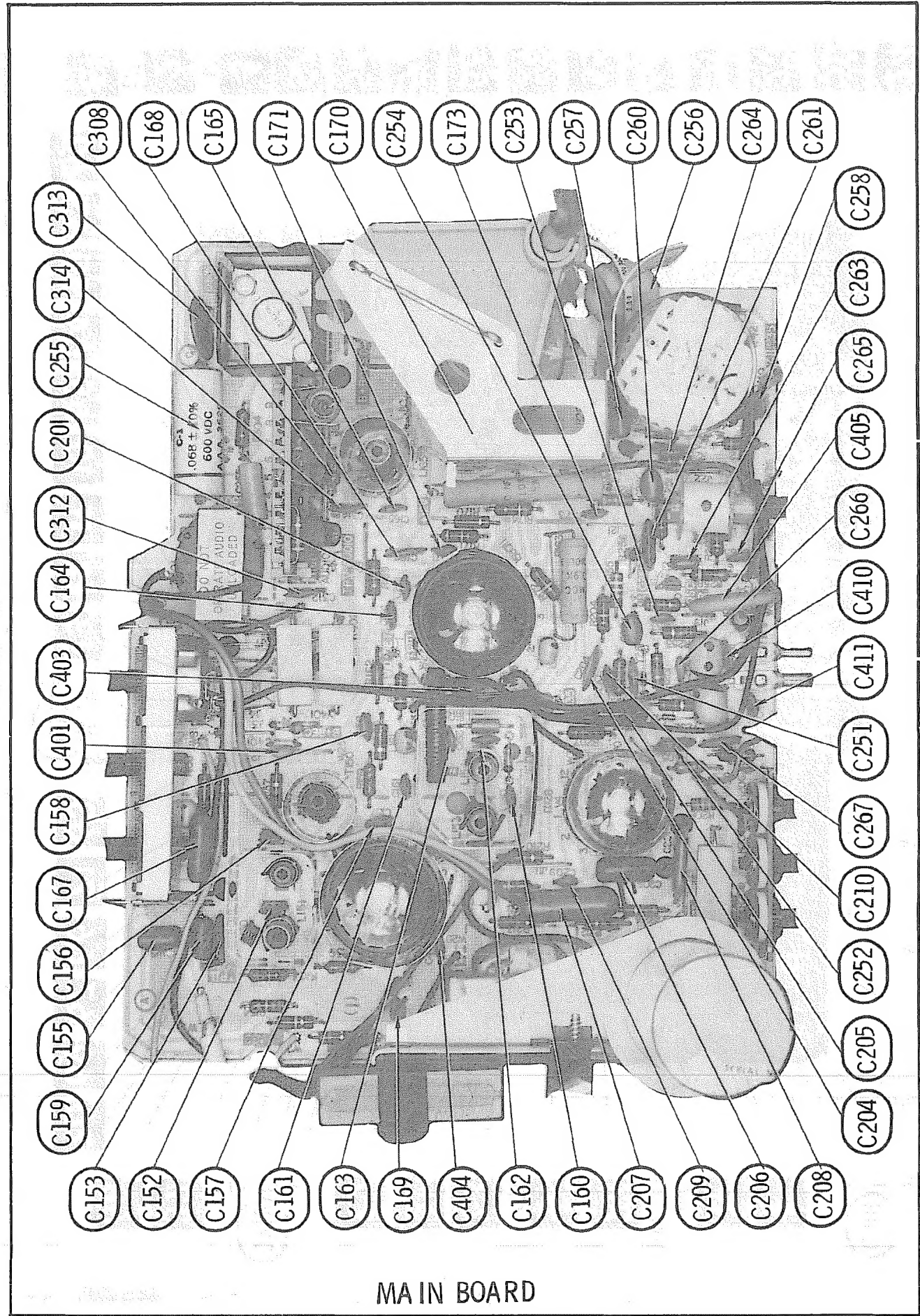
MAIN BOARD

A Howard W. Sams CIRCUITRACE Photo

GENERAL ELECTRIC CHASSIS  
95F, 125F, 155F

FOLDER 2





VHF TUNER PARTS LIST AND DESCRIPTION  
(When ordering parts, state Model, Part Number, and Description.)

AMPEREX			GENERAL ELECTRIC		RCA		SYLVANIA	
ITEM No.	USE		TYPE		ITEM No.	USE		TYPE
V1	RF Amp		3GKS #		V7	Oscillator - Mixer		6CGBA #

#1 For SAFETY, replace only with equivalent part.

CAPACITORS

ITEM No.	RATING	MFG. PART No.	REPLACEMENT DATA				
			ARCO/ELMENCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C103a	27pf NPO 5%	EU33X63	*			*	10TCS-V6.8
b	27pf NPO 5%						
c	27pf NPO 5%						
d	27pf NPO 5%						
C106	6.8pf N330 ±.5	EP18X604	*				10TCC-V30
C107	47pf	EU23X28					
C108	.001	EU23X13					
C109	3.3pf	ET21X64					
C110	.001	EU23X13	CCO-102	00-102	GP1000	SM210	25S-010
C111	15pf N330 5%	EU23X7					
C112	.001	EU22X76					
C113	56pf	ES23X3					
C114	.001	EU23X13	CCO-102	00-102	GP1000	SM210	25S-010
C115	.001	EU22X76					
C116	.001	EU22X4					
C117	.001	EU23X13					
C118	.001	EU23X13	*				10TCT-Q10
C119	.001	EU23X13					
C120	.001	EU23X13					
C121	10pf N470 ±.5						
C122	2.2pf IPO			DTZ-2R2	HP02P2	CN0522	10TCC-V22

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

COILS (RF-IF)

ITEM No.	USE	MFG. PART No.	NOTES	ITEM No.	USE	MFG. PART No.	NOTES
L101	Ant. RF, Mixer, Osc.	ES62X2	UHF Channel Strip	L110	Ant. RF, Mixer, Osc.	ES62X11	Channel 10 Strip
L102	Ant. RF, Mixer, Osc.	ES62X3	Channel 2 Strip	L111	Ant. RF, Mixer, Osc.	ES62X12	Channel 11 Strip
L103	Ant. RF, Mixer, Osc.	ES62X4	Channel 3 Strip	L112	Ant. RF, Mixer, Osc.	ES62X13	Channel 12 Strip
L104	Ant. RF, Mixer, Osc.	ES62X5	Channel 4 Strip	L113	Ant. RF, Mixer, Osc.	ES62X14	Channel 13 Strip
L105	Ant. RF, Mixer, Osc.	ES62X6	Channel 5 Strip	L135	IF Output	ET36X775	
L106	Ant. RF, Mixer, Osc.	ES62X7	Channel 6 Strip	L136	Fine Tuning	ET36X777	
L107	Ant. RF, Mixer, Osc.	ES62X8	Channel 7 Strip	T101	Ant. Input	EU37X35	
L108	Ant. RF, Mixer, Osc.	ES62X9	Channel 8 Strip		Ant. Input	ET62X233	Complete Assembly Includes RC101/02
L109	Ant. RF, Mixer, Osc.	ES62X10	Channel 9 Strip				

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M101	Shaft, Fine Tuning	ET69X356	
M102	Cam, Fine Tuning	ET2X323	
RC101	Component Combination	ET33X64	130pf, 1.85-3.5meg
RC102	Component Combination	ET33X64	130pf, 1.85-3.5meg

UHF TUNER PARTS LIST AND DESCRIPTION  
(When ordering parts, state Model, Part Number, and Description.)

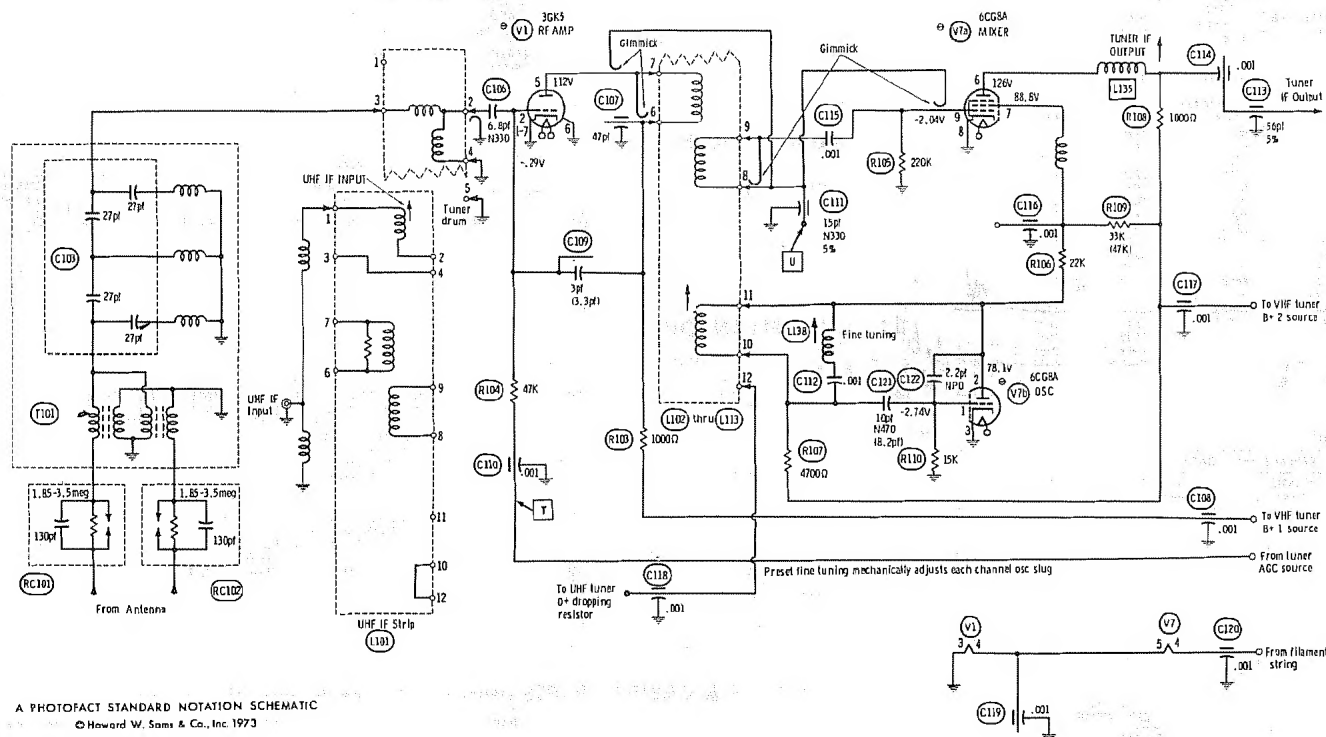
SEMICONDUCTORS

ITEM No.	TYPE / MFG. No. / PART No.	REPLACEMENT DATA						
		GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	MALLORY PART No.	MOTOROLA PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
Q100	2SC288A	GE-11 1N82A	1NTR-83 1N82AG	PTC133 PTC217	HEP720 HEP80700	SK3019 SK3099	RT108	ECG 108 ECG 112

CAPACITORS

ITEM No.	RATING	MFG. PART No.	REPLACEMENT DATA				
			ARCO/ELMENCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	27pf 5%						
C3	.5pf						
C4	15pf						
C5	.001						
C6	.001						
C7	.001						





## VHF TUNER ALIGNMENT INSTRUCTIONS

### OSCILLATOR ADJUSTMENTS

Individual oscillator slugs are accessible through a hole in the front of the tuner. Set the fine tuning at mid-range. Starting with the highest active channel, adjust the appropriate slugs, in descending order, for the best picture and sound.

### RF AND MIXER ADJUSTMENTS

Connect the sweep generator across antenna terminals with 120-ohm carbon resistor in each lead. Refer to chart below for generator frequencies. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the scope for horizontal deflection. Unless otherwise noted, connect a variable bias to the RF AGC line at Point T. Adjust bias to obtain response curve showing no overload.

CHANNEL	CONNECT SCOPE	REMARKS
13	Vertical input to point low side to ground.	Expand or compress appropriate coils for maximum gain and symmetry of response similar to Fig. 201 with markers as shown.
12 thru 2	Vertical input to point low side to ground.	Check all channels and make compromise adjustments by expanding or compressing appropriate coils if necessary.

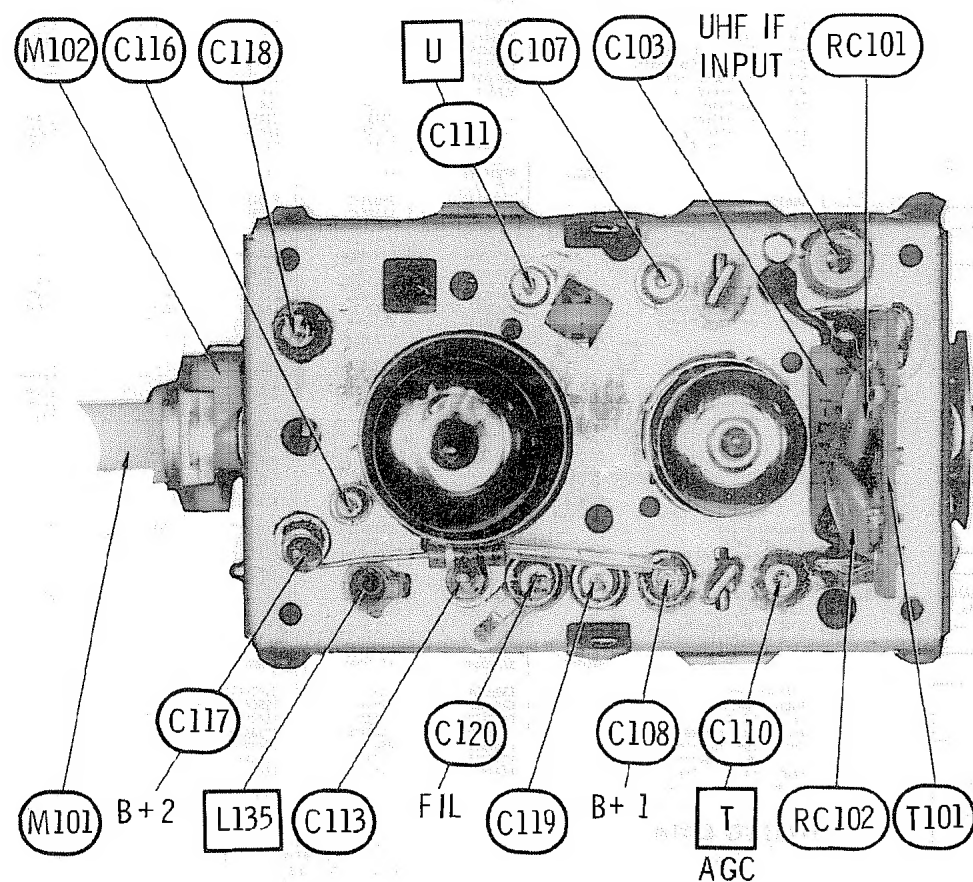
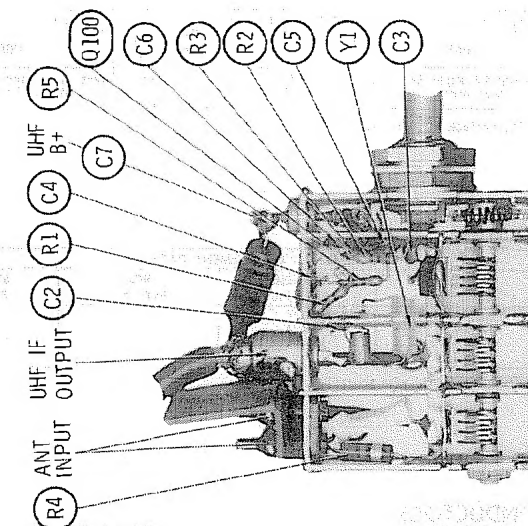
GENERATOR FREQUENCY			
Numbers in ( ) indicate channel number			
SWEEP	MARKER	SWEEP	MARKER
(2) 57MHz	55.25MHz	(6) 85MHz	83.25MHz
	59.75MHz		87.75MHz
(3) 63MHz	61.25MHz	(7) 177MHz	175.25MHz
	65.75MHz		179.75MHz
(4) 69MHz	67.25MHz	(8) 183MHz	181.25MHz
	71.75MHz		185.75MHz
(5) 79MHz	77.25MHz	(9) 189MHz	187.25MHz
	81.75MHz		191.75MHz
		(10) 195MHz	193.25MHz
			197.75MHz
		(11) 201MHz	199.25MHz
			203.75MHz
		(12) 207MHz	205.25MHz
			209.75MHz
		(13) 213MHz	211.25MHz
			215.75MHz

FIG. 201

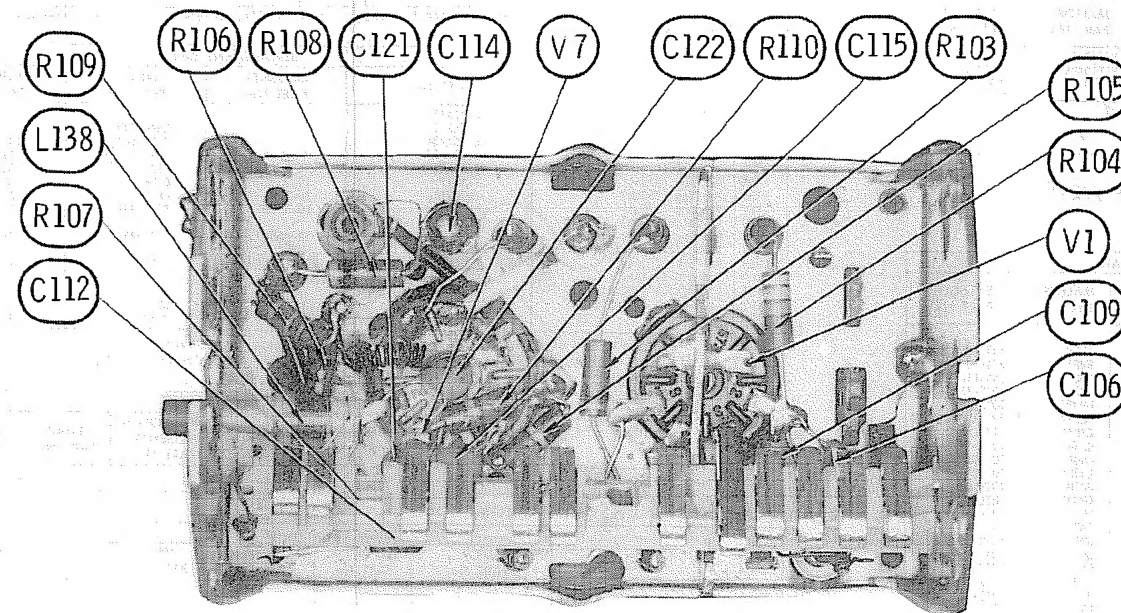
SOUND VIDEO

### UHF TUNER ALIGNMENT INSTRUCTIONS

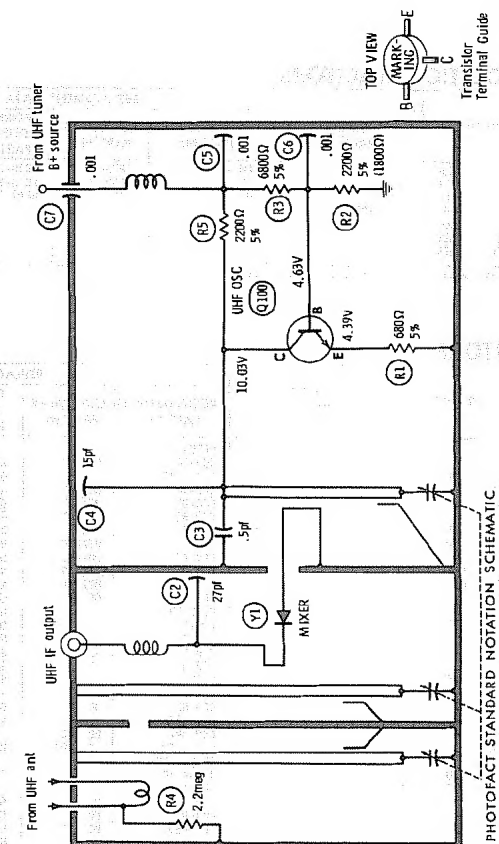
Select a UHF station. Adjust UHF IF input coil for best picture and sound.



VHF TUNER



UHF TUNER



## PARTS LIST AND DESCRIPTION

(When ordering parts, state Model, Part Number, and Description.)

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
Have your local distributor check Sams COUNTER FACTS\* for the most up-to-date replacement.

## TUBES

AMPEREX			GENERAL ELECTRIC			RCA			SYLVANIA		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE	ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V2	Video Amp-AGC Keyer-Sync Sep.	150D11 #	V4	Vert Oscillator-Vert Output	17J28 #	V5	1st Video IF-2nd Video IF	11Q11 #			
V3	Horiz Output-Damper	33GY7A #									

# For SAFETY, replace only with equivalent part.

## PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	MFGR. PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V6	9VAEP4 # 12CWP4 # 16CWP4 # or 16CWP4A #	9VAEP4 12CWP4 16CWP4		16CWP4 (1)	Used in Chassis 95F. Used in Chassis 125F. Used in Chassis 155F.

# For SAFETY, replace only with equivalent part.

(1) Silver Screen 85.

## SEMICONDUCTORS

ITEM No.	TYPE / MFGR. PART No.	REPLACEMENT DATA						
		GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	MALLORY PART No.	MOTOROLA PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
Y151	EP16K3	1N60	1N60	PTC206	HEP135	SK3088		ECG 109
Y251	ES16K27	GE-300	0200	PTC214	HEP1002	SK3100		ECG 177
Y252	ES16K30	GE-300	0200	PTC214	HEP1002	SK3100		ECG 177
Y253	ES57X21 #	GE-504A	806 or 5A60	PTC202	HEP0054	SK3068		ECG 503
Y401	ES57X1 #	GE-504A	806 or 5A60	PTC202	HEP0054	SK3071A or SK3032		ECG 116 or ECG 117
TC301	7149A #	GE-FET-2	FE-100	PTC152	HEP0021	SK3116		ECG 132
Q251	T1208/ES15X92	GE-18	1RTR-87	PTC125	HEP50001	SK3024		ECG 128
Q252	T1208/ES15X93	GE-12	1RTR-23	PTC104	HEP240	SK3021		ECG 124
Q301	RS7312/EP15X16							

# For SAFETY, replace only with equivalent part.

\* Part of Audio Module, Part #ES75X1.

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA						
		MFGR. PART No.	ARCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C301	10 25V		RME-B-G-010	EP30-10	PC10-25	VTT10A25	EY-1322	
C302	10 25V		RME-B-G-010	EP30-10	PC10-25	VTT10A25	EY-1322	
C307	1 50V		ME-1-J-001	EA50-2	WB10-50	MTA1050	TVA-1300	
C402a	300 175V	ES1X254 #					PCL-4449.1	
c	200 150V							
d	100 150V							

# For SAFETY, replace only with equivalent part.

## CAPACITORS

ITEM No.	RATING	MFGR. PART No.	REPLACEMENT DATA						
			ARCO/ELMENCOR PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.		
C152	24 .0022	NPO	5%	ET18X123	CC70-240	00-222	GP2200	GP222	10T5-022
C153	.1 50V				CCD-222		DPMS2P1	EW1A1010	225P10491W03
C156	.001 50V				CCD-102	00-102	GP1000	GP102	255-010
C157	820				CCD-821	00-821	GP820	GP822	10T5-T82
C158	820				CCD-821	00-821	GP820	GP822	10T5-T82
C159	.1 50V				CCD-821	00-821	GP820	GP822	10T5-T82
C160	470 NPO				CCD-471	072-477	NP0477	CH0547	10TCC-V47
C161	470 NPO				CCD-471	072-477	NP0477	CH0547	10TCC-V47
C162	4.7 NPO				CCD-471	072-477	NP0477	CH0547	10TCC-V47
C163	4.7 NPO				CCD-471	072-477	NP0477	CH0547	10TCC-V47
C164	820				CCD-821	00-821	GP820	GP822	10T5-T82
C165	12 NPO				CCD-120	00-120	NP012	CH0412	10TCC-012
C167	.1 200V				CCD-104	00-104	DPMS2P1	EW1A1010	225P10491W03
C168	.005 200V				CCD-502	00-502	GP502	GP502	10T5-T82
C169	820				CCD-821	00-821	GP820	GP822	10T5-T82
C170	820				CCD-821	00-821	GP820	GP822	10T5-T82
C171	270 N750				CCD-271	00-271	NP270	CH270	10TCC-271
C172	820				CCD-821	00-821	GP820	GP822	10T5-T82
C173	820				CCD-821	00-821	GP820	GP822	10T5-T82
C201	270 N750				CCD-271	00-271	NP270	CH270	10TCC-271
C204	.0039				CCD-392	00-392	DPMS2P1	EW1A1010	225P10491W03
C205	.0039				CCD-392	00-392	DPMS2P1	EW1A1010	225P10491W03
C206	.019 200V				CCD-104	00-104	DPMS2P1	EW1A1010	225P10491W03
C207	.1 400V				CCD-104	00-104	DPMS2P1	EW1A1010	225P10491W03
C208	.027 100V				CCD-104	00-104	DPMS2P1	EW1A1010	225P10491W03
C209	470				CCD-471	00-471	NP0477	CH0547	10TCC-V47
C210	820				CCD-821	00-821	GP820	GP822	10T5-T82
C251	.33 NPO				CCD-330	00-330	NP330	CH330	10TCC-033
C252	.33 NPO				CCD-330	00-330	NP330	CH330	10TCC-033
C253	.0033 50V				CCD-332	00-332	GP3300	GP330	255-033
C254	.047 50V				CCD-471	00-471	NP0477	CH0547	10TCC-V47
C255	.068 600V				CCD-680	00-680	GP680	GP680	10T5-T82
C256	300 N2200/3KV/10%	ES25X26 #			CCD-300	00-300	GP300	GP300	10T5-T82
C257	.1 50V	ET18X425			CCD-104	00-104	DPMS2P1	EW1A1010	225P10491W03

## CAPACITORS (cont)

ITEM No.	RATING	MFGR. PART No.	REPLACEMENT DATA				
			ARCO/ELMENCOR PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C258	820				CCD-821	00-821	GP820
C260	.047 50V	ES25X24			CCD-471	00-471	NP0477
C261	.0027				CCD-102	00-102	GP1000
C262	.0069 50V				CCD-821	00-821	GP820
C264	.005				CCD-821	00-821	GP820
C265	.005				CCD-821	00-821	GP820
C266	.005				CCD-821	00-821	GP820
C267	.005				CCD-821	00-821	GP820
C300	820				CCD-821	00-821	GP820
C303	.02				CCD-203	00-203	GP203
C304	.02				CCD-203	00-203	GP203
C305	.02				CCD-203	00-203	GP203
C306	.02				CCD-203	00-203	GP203
C307	.02				CCD-203	00-203	GP203
C308	.02				CCD-203	00-203	GP203
C309	.02				CCD-203	00-203	GP203
C310	.02				CCD-203	00-203	GP203
C311	.02				CCD-203	00-203	GP203
C312	.02				CCD-203	00-203	GP203
C313	.02				CCD-203	00-203	GP203
C314	.02				CCD-203	00-203	GP203
C401	.001 1KV				CCD-101	00-101	GP101
C403	820 150VAC				CCD-821	00-821	GP820
C404	820				CCD-821	00-821	GP820
C405	.01 150VAC	ES22X4 #			CCD-01	00-01	GP01
C410	.0015	EP18X37 #			CCD-015	00-015	GP015
C411	.0013	ES18X60 #			CCD-013	00-013	GP013

# For SAFETY, replace only with equivalent part.

## CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA				
			MFGR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
R164	Contrast	25K "a"	ES49X86				
R167	Brightness	200K "b"	(73C180025-16)				
R301	Volume/Switch	50K "a"	(1) (4)				
	Contrast	25K	ES49X81 (2)				
	Brightness	200K	ES49X82 (2)				
	Volume/Switch	50K	ES49X87 (2)				
R205	Vert Hold	1.2meg "b"	ES49X2				
R206	Vert Size	500K "c"	(73C18008-3)				
R209	Vert Linearity	2meg "a"	(3)				

(1) Includes R164, R167 and R301.

(2) Used in Models SF3202BW and SF3206W.

(3) Includes R205, R206 and R209.

(4) Alternate Part #ES49X89 used in Models SF1608VY, SF2110BK, SF2306W, SF2310W, SF3108K.

## RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		WORKMAN PART No.	MFGR. PART No.			WORKMAN PART No.	MFGR. PART No.
R149	100 1/2W, Carbon	CA100	#	R271	680 5%, 1/2W, Carbon	#	#
R150	10K 5%, 1/2W, Carbon	#	#	R272	820 5%, 1/2W, Carbon	#	#
R156	33 5%, 1/2W, Carbon	#	#	R304	220 5%, 1/2W, Carbon	#	#
R157	220 5%, 1/2W, Carbon	#	#	R305	220 5%, 1/2W, Carbon	#	#
R159	56 5%, 1/2W, Carbon	#	#	R401	5 10W, 1W, 1/2W, 1/4W, 1/8W, 1/16W, 1/32W, 1/64W, 1/128W, 1/256W, 1/512W, 1/1024W, 1/2048W, 1/4096W, 1/8192W, 1/16384W, 1/32768W, 1/65536W, 1/131072W, 1/262144W, 1/524288W, 1/1048576W, 1/2097152W, 1/4194304W, 1/8388608W, 1/16777216W, 1/33554432W, 1/67108864W, 1/134217728W, 1/268435456W, 1/536870912W, 1/1073741824W, 1/2147483648W, 1/4294967296W, 1/8589934592W, 1/17179869184W, 1/34359738368W, 1/68719476736W, 1/137438953472W, 1/274877906944W, 1/549755813888W, 1/1099511627776W, 1/2199023255552W, 1/4398046511104W, 1/8796093022208W, 1/17592186044416W, 1/35184372088832W, 1/70368744177664W, 1/140737488355328W, 1/281474976710656W, 1/562949953421312W, 1/1125899906842624W, 1/2251799813685248W, 1/4503599627370496W, 1/9007199254740992W, 1/18014398509481984W, 1/36028797018963968W, 1/72057594037927936W, 1/144115188075855872W, 1/288230376151711744W, 1/576460752303423488W, 1/1152921504606846976W, 1/2305843009213693952W, 1/4611686018427387904W, 1/9223372036854775808W, 1/18446744073709551616W, 1/36893488147419103232W, 1/73786976294838206464W, 1/147573952493664412928W, 1/295147904987328825856W, 1/590295809974657651712W, 1/1180591619949315303424W, 1/2361183239898630606848W, 1/4722366479797261213696W, 1/9444732959594522427392W, 1/188894651119890444448W, 1/377789302239780888896W, 1/755578604479561777792W, 1/1511157208959133555584W, 1/3022314417918267111168W, 1/6044628835836534222336W, 1/12089257671673068444672W, 1/24178515343346136889344W, 1/48357030686692273778688W, 1/96714061373384547557376W, 1/193428122746769095114752W, 1/386856245493538190229504W, 1/773712490987076380459008W, 1/154742498197415276091816W, 1/309484996394830552183632W, 1/618969992789661104367264W, 1/1237939985793322208734528W, 1/2475879971586644417469056W, 1/4951759943173288834938112W, 1/9903519886346577669876224W, 1/19807039772733155357752448W, 1/396140795454663107155504896W, 1/792281590909326214311009792W, 1/158456318181865242862201944W, 1/316912636363730485724403888W, 1/633825272727460971448807776W, 1/1267650545454921942897615552W, 1/2535301090909843885795231104W, 1/5070602181819687771590462208W, 1/1014120436363937554318012416W, 1/2028240872727875108736024832W, 1/4056481745455750217472049664W, 1/8112963490911500434944099328W, 1/16225926981823000869888196544W, 1/32451853963646001739776393088W, 1/64903707927292003479552786176W, 1/1298074158545840069591057733504W, 1/2596148317091680139182115467008W, 1/5192296634183360278364230934016W, 1/10384593268367200556728621668032W, 1/207691865367344011134572433		